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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,327	09/10/2004	Mark C. Peterman	AL001	5326

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EXAMINER	
DAM, DUSTIN Q	
ART UNIT	PAPER NUMBER
1795	

NOTIFICATION DATE	DELIVERY MODE
10/04/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ulman@nupat.com

Office Action Summary	Application No.	Applicant(s)	
	10/711,327	PETERMAN ET AL.	
	Examiner	Art Unit	
	DUSTIN Q. DAM	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 July 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) *6-8* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 22, 2010 has been entered.

2. In view of the Amendments to the Claims filed July 22, 2010, the rejections of claims 1-5 and 9 under 35 U.S.C. 102(b) previously presented in the Office Action sent May 27, 2010 have been substantially maintained and modified only in response to the Amendments to the Claims.

3. Claims 1-9 are currently pending while claims 6-8 have been withdrawn from consideration. Claims 1-5 and 9 have been fully considered.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by BOHM et al. (U.S. PG-Pub 2003/0015425 A1).

a. With regards to claim 1, BOHM et al. discloses a device for creating microgradients in solution comprising a microfluidic channel (any of channels 3a-3h, FIG. 17; & see **[0168]** for channel dimensions which are interpreted to read on the claimed "micro...channel") with openings at each end (opening of channels 3a-h leading to well 6a and well 6b, FIG. 17) and two or more apertures in the channel walls 9apertures 17, FIG. 17), two and only two electrodes (5 and 7, FIG. 17), a first electrode placed in or near a first opening at a first end of the channel (first electrode 5 disposed near the opening of channel 3 at well 6a, FIG. 17), and a second electrode placed in or near a second opening at a second end of the channel (second electrode 7 disposed near the opening of channel 3 at well 6b, FIG. 17), and an electrical power supply connected to the electrodes (12, FIG. 17), wherein, the apertures are continuously in contact with an external fluid bath while the openings are isolated from the bath ("bath" is interpreted to include a contained liquid for a special purpose; "continuously" is interpreted to include uninterrupted extension in space, time, or sequence; "contact" is interpreted to include a union or junction of surfaces; external fluid bath in device 18, FIG. 17; see **[0097]** describing device 18 comprises "second fluid sample" in which the second fluid sample is interpreted to read on the claimed "external bath" because the liquid is external to the channel and is contained for a special purpose; see **[0148]** describing device 18 dropping droplets of the second fluid sample, or the external bath, into apertures 17 in which droplets of the external bath are interpreted to provide for contact of the apertures with the external bath because the droplets of the second fluid sample provide for touching/a union/junction of the surface of the droplets with the surface of the apertures; the

openings of the channels 3 are isolated, or not in contact, with the external bath; the droplets of the second fluid sample are interpreted to "continuously" contact the apertures at least during a short time period wherein the droplet first contacts the apertures before completely entering the microchannels 3a-h).

b. With regards to claim 2, BOHM et al. discloses a device wherein the power supply is connected to the electrodes such that the device is structurally capable of generating several distinct current paths exist from one end of the channel to the other and current flows along all of these paths when an electric field is applied along the channel by the combination of the power supply and the electrodes (**[0145]** discloses power supply 12 and electrodes 5 & 7 produce a voltage in microchannels 3; the application of a voltage across the channels inherently provides several distinct current paths which current flows from one end of the channel to the other especially in view of the second fluid droplet located in apertures 17).

c. With regards to claim 3, BOHM et al. discloses a device wherein the power supply is connected to the electrodes such that the device is structurally capable of creating simultaneous flow of fluid through two or more of the apertures and structurally capable of creating a chemical concentration gradient is formed near the apertures (**[0145-0146]** describing fluid from external bath introduced, or flows through, apertures 17).

d. With regards to claim 4, BOHM et al. discloses a device wherein the length of the channel is between about ten microns and ten millimeters (**[0168]** "length of 20 mm" which is interpreted to read on the claimed "**about** ten microns and ten millimeters"), the

traverse dimensions of the channel is between about 0.1 and one hundred microns (**[0168]** "100 micrometer in width"), and the dimensions of the apertures are between about 0.1 and ten microns across (**[0084]** "between about 0.1 micrometers and about 200 micrometers").

e. With regards to claim 5, BOHM et al. discloses a device further comprising structures that form indentations in the channel near the apertures (the side walls of the apertures 17, FIG. 17 are interpreted to read on the claimed "structures" which the side walls of apertures 17 are indented relative to the top surface of the channel walls), such indentations being approximately the size of a living cell (**[0084]** describing indentations or aperture walls may be "between about 0.1 micrometers and about 200 micrometers").

f. With regards to claim 9, BOHM et al. discloses a microfluidic device comprising a microfluidic channel (any of channels 3a-3h, FIG. 17; & see **[0168]** for channel dimensions which are interpreted to read on the claimed "micro...channel") defining a flow path for a fluid having a known concentration of a selected chemical (channels 3a-h, FIG. 17 structurally capable of defining flow path for any chemical), the microchannel comprising a plurality of apertures defined in the channel (apertures 17, FIG. 17) structurally capable of providing continuous fluid communication between the channel and a reservoir containing a sample solution (reservoir 18 containing "second fluid sample" wherein the second fluid sample is interpreted to read on the claimed "sample solution"; see **[0097]**; see FIG. 17 depicting apertures 17 providing opening, which communicates, which channels 3 and reservoir 18 when droplets 19 contact the apertures; "continuous" is interpreted to include uninterrupted extension in space, time, or

sequence; the apertures are interpreted to provide "continuous", or uninterrupted, fluid communication between the channel and reservoir at least during a short time period wherein the droplet of sample solution first contacts the apertures before completely entering the microchannels 3a-h), and an inlet and an outlet that are isolated from the reservoir (inlet and outlets of channels 3a-h leading into openings 6a and 6b), electric field means (power supply 12 and electrodes 5 and 7) structurally capable of inducing electroosmotic flow along the flow path, wherein the electric field means comprise a number of electrodes that is less than or equal to the number of apertures (such as 2 electrodes 5 and 7 for two apertures per channel, FIG. 17), and means for applying pressure (such as gravitational pressure as wells 6a-b are open to gravitational forces) to the fluid in the flow path such that the device is structurally capable of allowing fluid flowing simultaneously out of the channel at the apertures and structurally capable of forming a concentration gradient at the apertures along the channel such that cells cultured near each aperture are exposed to a separate concentration of the chemical corresponding to the location of the aperture along the concentration gradient.

Response to Arguments

6. Applicant's arguments filed July 22, 2010 have been fully considered but they are not persuasive.

a. Applicant argues on page 6 of the response filed July 22, 2010 that the "Examiner states that Bohm's second fluid sample 18…from sample 18…" It is initially noted that the examiner has never stated BOHM cites reference number 18 as the second fluid

sample. Explicit in the previously presented rejections, the examiner states, "external fluid bath ***in*** device 18, FIG. 17; see **[0097]** describing ***device 18 comprises "second fluid sample"*** in which the ***second fluid sample*** is interpreted to read on the claimed "external bath" because the liquid is external to the channel and is contained for a special purpose".

b. Applicant argues on page 6 of the response filed July 22, 2010 that the droplets of the second fluid sample do not contact apertures 17 any more than a pitcher and catcher are in contact by virtue of one throwing the ball to the other. Firstly, it is entirely unclear as to how the examiner's interpretation of the BOHM et al. reference of record, which is in the art of microfluidics, must be qualified by matching an analogy about pitchers and catchers, presumably in the art of baseball. Regardless, only for prosecution clarity, applicant's arguments analogizing the microfluidic device of BOHM et al. and baseball players is unpersuasive and logically flawed. Applicant contends that the second fluid sample, cited external bath, of BOHM et al. is not in contact with the apertures as a pitcher is not in contact with a catcher by virtue of throwing a ball. However, the baseball analogy requires three components, a pitcher, a ball, and a catcher; meaning the ball is separate from the pitcher and is not an extension of the pitcher. In other words, the pitcher does not contact the catcher because no part of the pitcher touches or contacts the catcher, only the ball does. In stark contrast, the BOHM et al. reference discloses a second fluid sample, cited external bath, which drops a droplet of the same second fluid sample onto the apertures. In other words, the external bath, the second fluid sample of BOHM et al., is in contact with the apertures because a portion of the external bath, the droplets, definitely contacts the apertures.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DUSTIN Q. DAM whose telephone number is (571)270-5120. The examiner can normally be reached on Monday through Thursday, 6:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer Michener can be reached on (571)272-1424. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jennifer K. Michener/
Supervisory Patent Examiner, Art Unit 1795

dd
September 20, 2010